



PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

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TTY: 1-888-835-5322

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SPECTRUM TASK FORCE REQUESTS INFORMATION ON FREQUENCY BANDS IDENTIFIED BY NTIA AS POTENTIAL BROADBAND SPECTRUM

ET Docket No. 10-123

Comment Date: April 22, 2011

By the Chiefs, Office of Engineering and Technology and Wireless Telecommunications Bureau

By this Public Notice, we seek comment on the steps the Federal Communications Commission (FCC) can take to best promote wireless broadband deployment in the 1695-1710 MHz and 3550-3650 MHz bands recently identified by the National Telecommunications and Information Administration (NTIA) for accommodating wireless broadband. We also seek input to inform ongoing assessment of several additional bands NTIA has identified for potential deployment of wireless broadband. These bands include the 1755-1850 MHz, 4200-4220 MHz and 4380-4400 MHz bands, and others identified by NTIA as candidates for commercial use.

As background, the National Broadband Plan recommended that the FCC make 500 megahertz of spectrum available for broadband use within the next 10 years, including 300 megahertz between 225 MHz and 3.7 GHz for mobile use in the next 5 years.¹ In June 2010, President Obama issued a memorandum that, *inter alia*, instructed the Secretary of Commerce, working through NTIA, to collaborate with the FCC to make available over the next 10 years a total of 500 megahertz of Federal and non-Federal spectrum, suitable for both mobile and fixed wireless broadband use.²

In October 2010, NTIA identified the 1695-1710 MHz and 1755-1780 MHz, 3550-3650 MHz, 4200-4220 MHz and 4380-4400 MHz bands in its “fast track” review for their suitability for commercial use, and in addition identified approximately 2,000 megahertz of Federal and shared spectrum for further study.³

¹ Connecting America: The National Broadband Plan, Recommendation 5.8, p.84 (FCC, 2010). The National Broadband Plan is available at <http://www.broadband.gov/plan/>.

² Presidential Memorandum: Unleashing the Wireless Broadband Revolution, dated June 28, 2010, which is available at <http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution>. See also Plan and Timetable to Make Available 500 Megahertz of Spectrum for Wireless Broadband, U.S. Department of Commerce, Oct. 2010, (available at http://www.ntia.doc.gov/reports/2010/TenYearPlan_11152010.pdf) (“Ten-Year Plan”).

³ An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, and 4200-4220 MHz, 4380-4400 MHz Bands, U.S. Department of

One month later, the Commerce Department, through NTIA, recommended the reallocation of the 1695-1710 MHz and 3550-3650 MHz bands within the next 5 years,⁴ and in a January 2011 letter, NTIA asked the FCC to “take the necessary regulatory actions to make available for wireless broadband 15 megahertz at 1695-1710 MHz, and 100 megahertz at 3550-3650 MHz to be shared with currently allocated services.”⁵ On January 31, 2011, NTIA announced that it was conducting a detailed evaluation of the 1755-1850 MHz band to determine whether it can be repurposed for commercial broadband use.⁶

We seek specific comment on whether and to what extent these bands could be made available for broadband deployment. We are particularly interested in comments on the following issues:

- How do the technical assumptions upon which NTIA based its analyses affect how broadband services could be deployed in each band?
- How do the conditions placed on the bands (*e.g.*, exclusion zones) affect their usefulness for broadband deployment?
- What types of broadband technologies could be deployed in these bands and is equipment readily available? Does this equipment meet the technical assumptions in NTIA’s analyses? If not, how would the use of different technologies affect the availability of each band for broadband use?
- Will future broadband services require paired spectrum bands and, if so, what are the most suitable band pairings for the spectrum identified by NTIA? If the spectrum identified by NTIA is not paired, what broadband technologies might be deployed?
- Could broadband services share use of each band with Federal users and what techniques would be most effective for sharing (*e.g.*, coordination in time, geography, or policy, and / or the use of cognitive technologies)? If sharing would not be feasible, what process should be used to relocate or phase out incumbent users (both Federal and non-Federal) and what are candidate relocation frequency bands?

We discuss each frequency band in greater detail below.

1695-1710 MHz. The 1695-1710 MHz band is used for downlinks from certain weather satellites that are administered by the National Oceanographic and Atmospheric Administration (NOAA) for weather forecasting, storm tracking, and hazard warnings.⁷ NTIA recommends that the FCC allocate the band to the non-Federal mobile service and that we establish 72 to 121 km-radii exclusion zones to protect 18 Federal earth stations from harmful interference that may be caused by the new mobile service transmitters.⁸

Commerce, Oct. 2010, (available at http://www.ntia.doc.gov/reports/2010/FastTrackEvaluation_11152010.pdf) (“Fast Track Report”). Also, the Ten-Year Plan lists of other Federal and shared bands identified for further study. We note that the Ten-Year Plan also lists non-Federal bands identified by the FCC in the National Broadband Plan. In general, opportunity for public input on these non-Federal bands exists in other ongoing proceedings, and comments in this Public Notice on such bands are not solicited.

⁴ “U.S. Department of Commerce takes Major Step towards Unleashing the Wireless Broadband Revolution,” rel. Nov. 15, 2010 (available at http://www.ntia.doc.gov/press/2010/SpectrumReports_11152010.html).

⁵ Letter from Associate Administrator, Office of Spectrum Management, NTIA, to Chief, Office of Engineering and Technology, FCC, dated Jan. 19, 2011, available at http://www.ntia.doc.gov/filings/2011/NTIA_FCC_Letter_115%20MHz_01192011.pdf.

⁶ “NTIA Takes Next Step in 500 MHz Wireless Broadband Initiative, NTIA,” rel. Jan. 31, 2011 (available at http://www.ntia.doc.gov/press/2011/500mhzstatement_02012011.html). The 1755-1780 MHz portion of this band was previously identified in the Fast Track Report.

⁷ See Fast Track Report at pages 3-1 thru 3-25 and App. A (“Technical Characteristics for Federal Systems Operating in the 1695-1710 MHz Band”).

⁸ *Id.* at page 1-6, table 4-68, and App. H. The exclusion zones encompass areas in which approximately 12.65 percent of the U.S. population resides (based on 2000 U.S. Census data).

In June 2010, we sought comment on the potential for use of the larger 1675-1710 MHz band as part of this docket. Accordingly, and based on the existing record we have developed, we ask commenters to specifically address future broadband operations in the 1695-1710 MHz portion of the band that was identified in NTIA's January 2011 letter.

3550-3650 MHz. This 100 megahertz spectrum block is part of the larger 3500-3650 MHz band, which is allocated to the radiolocation and aeronautical radionavigation (ground-based) services on a primary basis for Federal use and to the radiolocation service on a secondary basis for non-Federal use. The 3600-3650 MHz band is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for non-Federal use, limited to international inter-continental systems.

Under the NTIA proposal, non-Federal users would be prohibited from operating up to as much as 570 km from the U.S. coastline, and additional exclusion zones would be established for ten locations.⁹ NTIA also recommends that the FCC require the use of radio frequency front-end filters with between 30 and 40 decibels of attenuation at 3500 MHz in order to protect the new mobile and base station receivers from high power radar interference.¹⁰

The exclusion zones along the coasts were established due to potential interference from federal ship-borne radars to commercial mobile systems and are based on known protection levels of the broadband system receivers. We seek comment on whether the receiver protection levels used in the analyses are appropriate for next generation broadband systems and whether potential commercial users would be able to take steps to operate with smaller exclusion zones. Would commercial users be willing to accept the increased interference risk that comes with smaller or no exclusion zones? How could this increased interference risk be addressed in our rules? We seek specific comment on whether the error detection and correction techniques employed in modern digital receivers can reduce the effects of pulsed interference from radar signals. Would commercial users be willing to accept receiver standards to allow better sharing with high powered adjacent band Federal systems? Additionally there will be periods when the radars are not operating. We invite comment as to whether there are techniques that can be developed to enable co-existence with the ship-borne radars, such as dynamic spectrum access to avoid use of this spectrum when interference is present and instead move communications traffic to other spectrum.

We note that NTIA selected the 3550-3650 MHz band because Worldwide Interoperability for Microwave Access (WiMAX) equipment has been developed for the band.¹¹ We seek information on the extent to which the technical considerations that apply to the adjacent 3650-3700 MHz band are applicable here. For example, should primary fixed-satellite service use of the 3600-3650 MHz band be restricted to currently licensed earth stations, and should such stations be protected on the same basis as the "grandfathered" primary stations in the 3650-3700 MHz band?

1755-1850 MHz. This band is allocated to the fixed, mobile, and space operation (Earth-to-space) services on a primary basis for Federal use, and is used by the Department of Defense (DOD), Federal law enforcement agencies, and other agencies for a variety of satellite, surveillance, aeronautical operations, fixed microwave and other operations. For example, some of the 20 channels that are used to control Federal satellite systems are within the 1755-1780 MHz band segment.

⁹ See *id.* at pages 1-6 and 4-84, Table 4-66, Figures 5-2 and 5-3, and App. B. In developing the coastal exclusion zone distance NTIA assumed that the shipborne radar was operating 10 km from the coast line. We note that this differs from the 81 km distance specified for the adjacent 3650-3700 MHz band (*see* US349 (stating the distance in nautical miles)).

¹⁰ *Id.* at page 4-78.

¹¹ *Id.* at page 2-5.

In the Fast Track Report, NTIA stated that it selected the 1755-1780 MHz segment for its potential to be paired with the 2155-2180 MHz band.¹² However, given the number of Federal users in the band, the diversity of Federal uses, and the need to find replacement spectrum for operations that would have to be relocated from the band if it were to be made available for wireless broadband, a rigorous review of the 1755-1780 MHz band has not yet been completed. We note, however, that both NTIA and individual Federal agencies have previously released reports, in 2000 and 2001, that address use of the 1755-1850 MHz band.¹³ These reports indicate that the satellite uplink operations could be in the band for approximately another twenty years.¹⁴ They also indicate that co-channel sharing was not feasible due to interference from the satellite Earth station uplink transmissions to mobile system receivers. We seek comment on whether establishing exclusion zones around the satellite Earth stations to protect wireless broadband receivers would result in the most efficient use of this spectrum recognizing that the receiver protection levels for the commercial systems in the earlier reports, and the resulting exclusion zones may no longer be applicable. Alternatively, we seek comment on whether broadband systems could operate more efficiently on a co-channel, co-coverage basis with the Earth stations using time sharing techniques. Commenters are strongly encouraged to provide supporting technical information for any geographic and time sharing techniques that are, or soon-to-be commercially available that could be applied in this spectrum to make it available for mobile broadband use.

4200-4220 and 4380-4400 MHz. These band segments are part of the 4200-4400 MHz band that is used worldwide for radio altimeters on aircraft. In the Fast Track Report, NTIA decided to further review this 40 megahertz of spectrum to explore to what extent radio altimeters operate in these particular band segments. We specifically invite comment on the extent to which radio altimeters are deployed and used in commercial and private aircraft. What sources of information are available on the technical operating characteristics of the radio altimeter transmitters and receivers (e.g., center frequency, bandwidth, modulation)? Because the need for international regulatory action by the International Telecommunication Union and the International Civil Aviation Organization means that this spectrum cannot be made available for broadband use in the United States before 2016, NTIA also plans to work to obtain international approval for reallocating this spectrum by that date.¹⁵

Additional Frequency Bands. We also seek comment on the Federal and shared-use bands identified as part of NTIA's Ten-Year Plan. Which of these bands appear to be most viable candidates for commercial broadband use and why? Is any of this spectrum well suited for the relocation of incumbent services in order to open broadband opportunities in other bands? Are there bands or specific frequencies that would be beneficial from an international harmonization perspective? What technical criteria should be used to characterize the systems that might be deployed in these bands for purposes of analyses?

¹² *Id.* at pages 2-3 to 2-5 and 3-25 to 3-29.

¹³ *See, e.g.*, The Potential for Accommodating Third Generation Mobile Systems in the 1710-1850 MHz Band: Federal Operations, Relocation Costs, and Operational Impacts, Final Report, March 2001, NTIA Special Publication 01-46 (available at <http://www.ntia.doc.gov/ntiahome/threeg/33001/3g33001.pdf>) at page 3-12; Federal Operations in the 1755-1850 MHz Band: The Potential for Accommodating Third Generation Mobile Systems, Interim Report, dated November 15, 2000, NTIA Special Publication 01-41 (available at <http://www.ntia.doc.gov/osmhome/reports/imt2000/imt2000.pdf>); and Department of Defense IMT-2000 Technical Working Group's Investigation of the Technical Feasibility of Accommodating the International Mobile Telecommunications (IMT) 2000 Within the 1755-1850 MHz Band, Interim Report, dated October 27, 2000 (available at http://www.ntia.doc.gov/osmhome/reports/dodreport/DOD_IMT2K.pdf).

¹⁴ *See, e.g.*, The Potential for Accommodating Third Generation Mobile Systems in the 1710-1850 MHz Band: Federal Operations, Relocation Costs, and Operational Impacts, Final Report, March 2001, NTIA Special Publication 01-46 at page xvi.

¹⁵ *See* Fast Track Report at pages 2-6 to 2-7.

Filing information. Comments are due by April 22, 2011. Interested parties may file comments addressing these questions on or before this date. *See* 47 U.S.C. § 154(i); 47 C.F.R. §§ 0.241. All comment filings should reference the subject public notice and **ET Docket No. 10-123**. Comments may be filed by using (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. *See* Electronic Filing of Documents in Rulemaking Proceedings, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://fjallfoss.fcc.gov/ecfs2/> or the Federal eRulemaking Portal: <http://www.regulations.gov>.
- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.
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All filings must be addressed to the Commission's Secretary, Marlene H. Dortch, Office of the Secretary, Federal Communications Commission, 445 12th Street, SW, Washington, D.C. 20554. Parties must also serve one copy with the Commission's copy contractor, Best Copy and Printing, Inc. (BCPI), Portals II, 445 12th Street, SW, Room CY-B402, Washington, D.C. 20554, (202) 488-5300, or via e-mail to fcc@bcpiweb.com.

Documents in the above docket will be available for public inspection and copying during business hours at the FCC Reference Information Center, Portals II, 445 12th St. SW, Room CY-A257, Washington, D.C. 20554. The documents may also be purchased from BCPI at (202) 488-5300 (voice), (202) 488-5563 (facsimile), (202) 488-5562 (TTY), e-mail fcc@bcpiweb.com.

For further information, contact Tom Mooring (202-418-2450; Tom.Mooring@fcc.gov) or Ronald Repasi (202) 418-2470; Ronald.Repasi@fcc.gov) (OET) and Peter Daronco (202-418-7235; Peter.Daronco@fcc.gov) or John Leibovitz (202-418-0690; John.Libovitz@fcc.gov) (WTB).

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